Name: Date:

Polynomial Factoring solution (version 684)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 6x + 37 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(37)}}{2(1)}$$

$$x = \frac{-(6) \pm \sqrt{36 - 148}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{-112}}{2}$$

$$x = \frac{-6 \pm \sqrt{-16 \cdot 7}}{2}$$

$$x = \frac{-6 \pm 4\sqrt{7}\,i}{2}$$

$$x = -3 \pm 2\sqrt{7}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 + 3i$ and $-5 + 8i$ in standard form $(a + bi)$.**

Solution

$$(7 + 3i) \cdot (-5 + 8i)$$

$$-35 + 56i - 15i + 24i^2$$

$$-35 + 56i - 15i - 24$$

$$-35 - 24 + 56i - 15i$$

$$-59 + 41i$$

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3. **Write function $f(x) = x^3 + 7x^2 + 7x - 15$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	7	7	-15
1		1	8	15
	1	8	15	0

$$f(x) = (x-1)(x^2+8x+15)$$

$$f(x) = (x-1)(x+3)(x+5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+1)\cdot(x-4)^2\cdot(x-7)$$

Sketch a graph of polynomial $y = p(x)$.